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HISTORY AND MODERN TRENDS OF DIGITALIZATION AND USE OF MULTIMEDIA TOOLS IN PHYSICAL EDUCATION LESSONS

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ABSTRACT
This article analyzes the historical stages and modern trends of digitalization of physical education lessons and the introduction of multimedia tools in the global education system. The paper examines the impact of physical education on the learning process, starting with the first video technologies of the late 20th century and ending with modern wearable devices, artificial intelligence (AI), virtual (VR) and augmented (AR) reality, and specialized fitness platforms. In the course of the study, international experiences and modern models of digital education were explored, and the advantages and existing challenges of digitalizing physical education were systematized.
Keywords: physical education, digitalization, multimedia tools, educational trends, artificial intelligence, VR/AR, wearable technologies, smart education.

INTRODUCTION
In the era of globalization and digital transformation, all sectors of the education system, including physical culture, are undergoing fundamental updates. Physical education, traditionally viewed as consisting solely of physical movement and practical exercises, is now integrating with innovative information technologies.
The digitalization and application of multimedia tools in physical education lessons open up new opportunities to increase student motivation, precisely analyze movement biomechanics, and monitor health indicators. This article is dedicated to researching the historical formation and the most advanced modern trends of these processes within the global educational space.

RESEARCH METHODOLOGY
During the research process, methods of systemic analysis, comparative-historical analysis, scientific literature review, and the synthesis of international experiences in digitalizing physical education—specifically from the USA, Singapore, the European Union, and China—were utilized.

RESEARCH RESULTS AND DISCUSSION
1. Historical Stages of Digitalization in Physical Education
The history of introducing technical tools into physical education lessons can be conditionally divided into three main stages:

- **Initial Stage (1970s–1980s):** The use of magnetic tape videocassette recorders (VCRs) and televisions. During this period, lessons mainly featured the screening of ready-made video materials depicting the Olympic Games or specific exercise complexes. The methodical approach was based on passive observation.

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- **Multimedia Stage (1990s–Early 2000s):** The emergence of personal computers and CD/DVD discs. The first electronic textbooks, interactive presentations (PowerPoint), and simple animations began to be used to teach the theoretical foundations of physical education.
- **Modern Digital Transformation Stage (Post-2010):** In this stage, high-speed internet, cloud technologies, and mobile applications have become an inseparable part of the physical education system.

2. Modern Trends and Innovative Tools

Today, the following multimedia and digital tools lead the organization of the physical education process in global educational practice:

A) Wearable Technologies and Smart Devices

Fitness bands (smartwatches), heart rate monitors, and pedometers allow real-time monitoring of each student's heart rate, burned calories, and physical activity during lessons. This facilitates the individualization of physical workloads.

B) VR (Virtual Reality) and AR (Augmented Reality) Technologies

In modern physical education, students use VR headsets to safely test the technical elements of various sports (e.g., skiing, swimming, rock climbing) in a virtual environment. AR technologies create interactive walls and floors in sports halls, taking gamified workouts to a whole new level.

C) Mobile Applications and Cloud Platforms (Strava, Google Fit, Nike Run Club)

These applications play an essential role in distance learning and monitoring independent physical training. Students upload their completed exercises into the system, and teachers evaluate them remotely.

D) Artificial Intelligence (AI) and Video Analysis Systems

Computer Vision and AI algorithms analyze the student's movement biomechanics (such as running or jumping postures), detect errors within seconds, and provide recommendations to prevent injuries.

EXAMPLES FROM GLOBAL EXPERIENCE:

- **USA:** Within the framework of the "SPARK" program, the use of digital technologies in physical education lessons has been standardized.
- **Singapore:** Physical fitness testing in schools (NAPFA) is completely digitalized, and the system's conclusions are stored in a centralized cloud database.

Technology Type	Role in Physical Education	Impact on Education
Smartwatches	Measuring heart rate and physical activity	Personalized health monitoring
VR/AR Systems	Simulating technical elements of sports	Ensuring engagement and safety
Artificial Intelligence	Analyzing movement biomechanics	Correcting errors and preventing injuries

CONCLUSION AND RECOMMENDATIONS

The digitalization and use of multimedia tools in the global physical education system do not imply abandoning traditional sports, but rather adapting them to modern requirements. Digitalization increases the effectiveness of lessons and systematically directs the younger generation toward a healthy lifestyle.

The following recommendations are put forward for the education system of Uzbekistan:

1. Introducing specialized courses on "Digital Physical Education" for future teachers in physical education higher education institutions.
2. Gradually equipping school gyms with smart technologies and multimedia displays.

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3. Developing a national mobile platform to monitor students' physical development and fitness indicators.

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